

WHAT IS CLAIMED IS:

1 1. An assay for identifying a compound useful for blocking CMV
2 dissemination is a host, comprising the step of determining whether said compound
3 inhibits the binding of a chemokine to US28 or a US28 fragment.

1 2. An assay in accordance with claim 1, wherein said chemokine is
2 selected from the group consisting of fractalkine, MIP-1 α , MIP-1 β , MCP-1 and
3 RANTES.

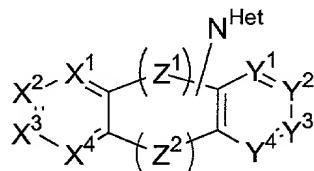
1 3. An assay in accordance with claim 1, wherein said chemokine is
2 fractalkine.

1 4. An assay in accordance with claim 1, wherein said step of
2 determining comprises specifically binding labeled fractalkine to the ligand binding
3 domain of US28.

1 5. A method for preventing dissemination of CMV in a human,
2 comprising administering an effective amount of a compound which blocks the binding of
3 a chemokine to US28 or a US28 fragment.

1 6. A method in accordance with claim 5, wherein said compound was
2 identified by the assay of claim 1.

1 7. A method in accordance with claim 5, wherein said compound has
2 the formula:



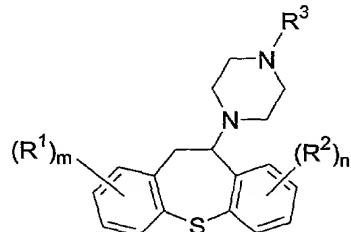
3
4 wherein

5 X¹, X², X³ and X⁴ are each independently members selected from the group
6 consisting of N and C-R¹, wherein R¹ is a member selected from the group
7 consisting of H, halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl,
8 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
9 and di(C₁-C₄)alkylamino;

10 Y¹, Y², Y³ and Y⁴ are each independently members selected from the group
11 consisting of N and C-R², wherein R² is a member selected from the group
12 consisting of H, halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl,
13 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
14 and di(C₁-C₄)alkylamino;
15 Z¹ is a divalent moiety selected from the group consisting of (C₁-C₃)alkylene;
16 Z² is a divalent moiety selected from the group consisting of -O-, -S- and -N(R³)-
17 wherein R³ is a member selected from the group consisting of H, halogen,
18 (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl, (C₁-C₄)haloalkoxy, nitro,
19 cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino, and di(C₁-C₄)alkylamino;
20 and
21 N^{Het} is a substituted or unsubstituted 4-, 5-, 6-, or 7-membered nitrogen
22 heterocycle.

1 8. A method in accordance with claim 7, wherein X¹, X³, X⁴, Y¹, Y²,
2 Y³ and Y⁴ are all CH; Z² is -S-, and N^{Het} is a substituted 6-membered nitrogen
3 heterocycle.

1 9. A method in accordance with claim 5, wherein said compound has
2 the formula:



3 wherein

5 the subscripts m and n are independently integers of from 0 to 3;
6 R¹ and R² are substituents independently selected from the group consisting of
7 halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)alkylthio, (C₁-C₄)haloalkyl,
8 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
9 and di(C₁-C₄)alkylamino; and
10 R³ is a substituent selected from the group consisting of (C₁-C₄)alkyl, (C₁-
11 C₄)haloalkyl and (C₁-C₄)acyl.

1 10. A method in accordance with claim 9, wherein m is 0 and n is 1.

1 11. A method in accordance with claim 9, wherein m is 0, n is 1 and R²
2 is selected from the group consisting of halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-
3 C₄)alkylthio and (C₁-C₄)haloalkyl.

1 12. A method in accordance with claim 9, wherein m is 0, n is 1 and R²
2 is selected from the group consisting of halogen and (C₁-C₄)alkylthio.

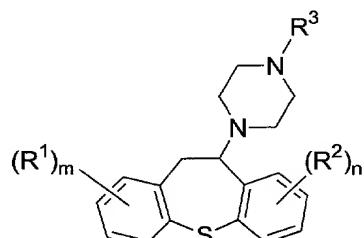
1 13. A method in accordance with claim 5, wherein said compound is
2 selected from the group consisting of methiothepin, octoclothepin and pharmaceutically
3 acceptable salts thereof.

1 14. A method for reducing cell motility in a CMV-infected cell, said
2 method comprising contacting said CMV-infected cell with a motility-reducing amount of
3 a compound that inhibits chemokine binding to US28 on the surface of said infected cell.

1 15. A method in accordance with claim 14, wherein said chemokine is
2 a member selected from the group consisting of fractalkine, MIP-1 α , MIP-1 β , MCP-1
3 and RANTES.

1 16. A method in accordance with claim 14, wherein said chemokine is
2 fractalkine.

1 17. A method in accordance with claim 14, wherein said compound
2 has the formula:



3 wherein
4 the subscripts m and n are independently integers of from 0 to 3;
5 R¹ and R² are substituents independently selected from the group consisting of
6 halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)alkylthio, (C₁-C₄)haloalkyl,
7 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
8 and di(C₁-C₄)alkylamino; and

10 R³ is a substituent selected from the group consisting of (C₁-C₄)alkyl, (C₁-
11 C₄)haloalkyl and (C₁-C₄)acyl.

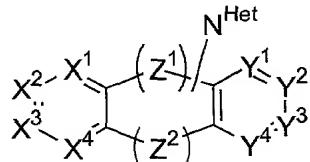
1 18. A method in accordance with claim 17, wherein m is 0 and n is 1.

1 19. A method in accordance with claim 17, wherein m is 0, n is 1 and
2 R² is selected from the group consisting of halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-
3 C₄)alkylthio and (C₁-C₄)haloalkyl.

1 20. A method in accordance with claim 17, wherein m is 0, n is 1 and
2 R² is selected from the group consisting of halogen and (C₁-C₄)alkylthio.

1 21. A method in accordance with claim 14, wherein said compound is
2 selected from the group consisting of methiothepin, octoclothepin and pharmaceutically
3 acceptable salts thereof.

1 22. A pharmaceutical composition comprising a pharmaceutically
2 acceptable carrier and a compound of the formula:



3 wherein

5 X¹, X², X³ and X⁴ are each independently members selected from the group
6 consisting of N and C-R¹, wherein R¹ is a member selected from the group
7 consisting of H, halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl,
8 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
9 and di(C₁-C₄)alkylamino;

10 Y¹, Y², Y³ and Y⁴ are each independently members selected from the group
11 consisting of N and C-R², wherein R² is a member selected from the group
12 consisting of H, halogen, (C₁-C₄)alkyl, (C₁-C₄)alkoxy, (C₁-C₄)haloalkyl,
13 (C₁-C₄)haloalkoxy, nitro, cyano, (C₁-C₄)acyl, amino, (C₁-C₄)alkylamino,
14 and di(C₁-C₄)alkylamino;

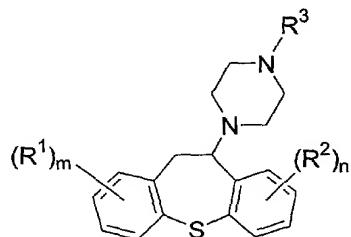
15 Z¹ is a divalent moiety selected from the group consisting of (C₁-C₃)alkylene;

16 Z^2 is a divalent moiety selected from the group consisting of $-O-$, $-S-$ and $-N(R^3)-$
17 wherein R^3 is a member selected from the group consisting of H, halogen,
18 (C_1-C_4) alkyl, (C_1-C_4) alkoxy, (C_1-C_4) haloalkyl, (C_1-C_4) haloalkoxy, nitro,
19 cyano, (C_1-C_4) acyl, amino, (C_1-C_4) alkylamino, and di (C_1-C_4) alkylamino;
20 and

21 N^{Het} is a substituted or unsubstituted 4-, 5-, 6-, or 7-membered nitrogen
22 heterocycle.

1 23. A composition in accordance with claim 22, wherein X^1 , X^3 , X^4 ,
2 Y^1 , Y^2 , Y^3 and Y^4 are all CH; Z^2 is $-S-$, and N^{Het} is a substituted 6-membered nitrogen
3 heterocycle.

1 24. A composition in accordance with claim 22, wherein said
2 compound has the formula:



3 wherein

5 the subscripts m and n are independently integers of from 0 to 3;
6 R¹ and R² are substituents independently selected from the group consisting of
7 halogen, (C_1-C_4) alkyl, (C_1-C_4) alkoxy, (C_1-C_4) alkylthio, (C_1-C_4) haloalkyl,
8 (C_1-C_4) haloalkoxy, nitro, cyano, (C_1-C_4) acyl, amino, (C_1-C_4) alkylamino,
9 and di (C_1-C_4) alkylamino; and
10 R³ is a substituent selected from the group consisting of (C_1-C_4) alkyl, $(C_1-$
11 $C_4)$ haloalkyl and (C_1-C_4) acyl.

1 25. A composition in accordance with claim 24, wherein m is 0 and n
2 is 1.

1 26. A composition in accordance with claim 24, wherein m is 0, n is 1
2 and R² is selected from the group consisting of halogen, (C_1-C_4) alkyl, (C_1-C_4) alkoxy, $(C_1-$
3 $C_4)$ haloalkyl and (C_1-C_4) alkylthio.

1 27. A composition in accordance with claim 24, wherein m is 0, n is 1
2 and R² is selected from the group consisting of halogen and (C₁-C₄)alkylthio.

1 28. A composition in accordance with claim 24, wherein said
2 compound is selected from the group consisting of methiothepin, octoclothepin and
3 pharmaceutically acceptable salts thereof.